

MICHELLE M. GIERACH

Jet Propulsion Laboratory, California Institute of Technology
M/S 300-323 • 4800 Oak Grove Drive • Pasadena, CA 91109
Phone: (818) 354-1933 • Fax: (818) 354-0966
michelle.gierach@jpl.nasa.gov

EDUCATION

- 2009 Ph.D. Marine Science, University of South Carolina, Columbia, SC
Dissertation: *Analysis of the Upper Ocean Response to Hurricanes in the Gulf of Mexico Using Satellite Observations and Model Simulations*
Advisor: Dr. Subrahmanyam Bulusu
- 2006 M.S. Meteorology, Florida State University, Tallahassee, FL
Thesis: *Vorticity-based Detection of Tropical Cyclogenesis*
Advisors: Dr. James J. O'Brien and Mark A. Bourassa
- 2004 B.S. Meteorology, Florida State University, Tallahassee, FL
Minors: Mathematics and Physics

PROFESSIONAL EXPERIENCE

- 2011-present Research Scientist, Jet Propulsion Laboratory, Pasadena, CA
- 2009-2011 Postdoctoral Associate, University of Miami, Rosenstiel School of Marine and Atmospheric Science, Miami, FL
- 2006-2009 Graduate Research Assistant, University of South Carolina, Columbia, SC
- 2004-2006 Graduate Research Assistant, Florida State University, Tallahassee, FL

LEADERSHIP EXPERIENCE

- 2016-2019 Project Scientist for NASA EVS-2 COral Reef Airborne Laboratory (CORAL)
- 2011-present Project Scientist for the Physical Oceanography Distributed Active Archive Center (PO.DAAC)

AWARDS

- 2015 JPL Lew Allen Award for Excellence
- 2015 JPL Voyager Award
- 2013 NASA Early Career Achievement Medal
- 2009 Dean's Award for Excellence in Graduate Study

FUNDED PROPOSALS

- 2016-2019 NASA Earth Venture Suborbital-2, Co-I (Project Scientist), *CORAL: COral Reef Airborne Laboratory*
- 2015-2017 NASA Rapid Response, PI, *Rapid Response to the ORCAS Campaign*
- 2015-2018 OCO-2 Science Team, Co-I, *Operations and data products for carbon-climate feedbacks using OCO-2*
- 2013-2016 NASA Physical Oceanography, Co-I, *Seasonal evolution of the coastal thermal front and small eddies in the Great Lakes as characterized by satellite SST and SAR imagery and numerical modeling*

2013-2015	NASA Ocean Biology and Biogeochemistry, PI, <i>Variation in phytoplankton composition associated with ENSO diversity in the Equatorial Pacific Ocean</i>
2012-2015	NASA New (Early Career) Investigator Program in Earth Science, PI, <i>Impact of ENSO diversity on biophysical processes in the Tropical and North Pacific Ocean</i>
2008-2009	NASA South Carolina Space Grant Consortium Graduate Student Research Program Fellowship, PI, <i>Hurricane contribution to air-sea fluxes of CO₂</i>

PROFESSIONAL ACTIVITIES

2015	Subject Matter Editor for Ecological Applications Journal
2015	NASA representative at the U.N. Climate Change Conference (COP-21)
2015	NASA representative for the 2016 National Earth Observation Assessment
2015	Pre-decadal carbon-climate steering group member
2015	Pre-decadal ocean biology and biogeochemistry (OBB) steering group member
2015	International Ocean Color Science (IOCS) session chair, "Advances in hyperspectral remote sensing science"
2015	Co-organizer of the "Ocean Surface Mixed-Layer Processes & Air-Sea Interactions: A Critical Challenge for Climate Science" workshop, JPL Center for Climate Sciences, Pasadena, CA
2014-present	NASA Early Career Scientist/Engineer Working Group (ECSEWG) member
2014	NASA representative at the U.N. Climate Change Conference (COP-20)
2014	Ocean Sciences session chair, "Effects of climate variability on marine biophysical interactions and ecosystems dynamics"
2014	Invited expert for the Tropical Pacific Observing System (TPOS2020) meeting
2014	Participant in the "Satellites to the Seafloor: Autonomous science to form a breakthrough in quantifying the global ocean carbon budget" workshop, California Institute of Technology, Keck Institute for Space Studies, Pasadena, CA
2013	Co-organizer of the Carbon Workshop, JPL Center for Climate Sciences, Pasadena, CA
2013	USGCRP Oceans and Coasts Indicator team member
2013	NASA ESD Decadal Survey System Trade Study: Data Latency Needs and Requirements steering committee member
2013	NASA panel reviewer, Science of Aqua and Terra
2012-2014	IOOS Data Management And Communications (DMAC) steering team member (NASA representative)
2012	JPL Early Career Hire State of the Laboratory panel member
2011	NASA panel reviewer, Physical Oceanography
2011	Session co-chair at the NASA International Ocean Vector Wind Science Team (IOVWST) meeting
2009-present	Journal Reviewer for Geophysical Research Letters, Journal of Geophysical Research, Journal of Applied Meteorology and Climatology, Remote Sensing of Environment, Estuaries and Coasts, Marine Environmental Research, Marine Ecology Progress Series

MENTORING

2015	Co-Advisor for NASA DEVELOP graduate students
2015-present	Advisor for Severine Fournier (NPP postdoctoral associate)

- 2014-present Advisor for Cedric Fichot (Caltech postdoctoral associate)
2014 Co-Advisor for NASA DEVELOP graduate students
2014 Thesis Jury for Severine Fournier, IFREMER

FIELD EXPERIENCE

- 2010 R/V Roger Revelle - Deployment of ASIS and EASI buoys for ONR "Impact of Typhoons on the Pacific" (ITOP) DRI, Kaohsiung, Taiwan
2009 WHOI R/V Oceanus - Test deployment of ASIS and EASI buoys for ONR ITOP DRI, Jacksonville, FL

OUTREACH

- 2015 Presenter at JPL Open House
2015 Science Judge at the National Ocean Sciences Bowl in Pasadena, CA
2014 Moderator at the National Ocean Sciences Bowl in Pasadena, CA
2013 Participator/Contributor in NASA Earth Science Week via a blog on the role of mapping in research
2013 NASA's Know Your Earth 3.0, local connections campaign
2012 Presenter at NASA/JPL Climate Day
2012 Presenter/Participator at the COSEE-West/NASA/JPL Salinity Workshop for K-12 educators
2012 Participator/Contributor in NASA Earth Science Week via a blog at Women@NASA and career spotlight video
2011 Presenter at JPL Open House and NASA/JPL Climate Day
2011 Presenter/Participator at the COSEE-West Ocean Observing Systems Workshop for K-12 educators
2011 Moderator at the National Ocean Sciences Bowl in Miami, FL
2010 Group leader for the American Association of University Women's Women in Science Day for 6-7th grade girls
2008 Guest lecturer at the COSEE Taking the Pulse of Our Coastal Ocean Workshop for K-12 educators
2008 Guest lecturer at the National Ocean Sciences Bowl in Columbia, SC

REFEREED PUBLICATIONS

- Fichot, C. G., B. Downing, B. Bergamaschi, L. Windham-Myers, M. Marvin-DiPasquale, D. R. Thompson, and **M. M. Gierach**, 2015: High-resolution remote sensing for water quality monitoring in the California Bay-Delta, *Environmental Science and Technology*, submitted.
- Fournier, S., T. Lee, and **M. M. Gierach**, 2015: Monitoring and understanding seasonal and interannual variations of sea surface salinity associated with the Mississippi River plume, *Remote Sens. Environ.*, submitted.
- Thompson, D. R., F. C. Seidel, B. C. Gao, **M. M. Gierach**, R. O. Green, R. M. Kudela, and P. Mouroulis, 2015: Optimizing irradiance estimates for coastal and inland water imaging spectroscopy. *Geophys. Res. Lett.*, 42, doi:10.1002/2015GL063287.
- Gierach, M. M.**, B. Holt, R. Trinh, B. Pan, and C. Rains, 2014: Satellite detection of wastewater diversion plumes in southern California. *Estuarine, Coastal and Shelf Science*, accepted with minor revisions.
- Lee, T., G. Lagerloef, H.-Y. Kao, M. J. McPhaden, J. Willis, **M. M. Gierach**, 2014: The influence of salinity on Tropical Atlantic instability waves and eddies. *J. Geophys. Res.*, 119(12), 8375-8394, doi:10.1002/2014JC010100.
- Gierach, M. M.**, M. Messié, T. Lee, K. B. Karnauskas, and M.-H. Radenac, 2013: Biophysical Responses near Equatorial Islands in the Western Equatorial Pacific Ocean during El Niño/La Niña Transitions. *Geophys. Res. Lett.*, 40(20), 5473-5479, doi:10.1002/2013GL057828.
- Gierach, M. M.**, J. Vazquez, T. Lee, V. Tsontos, 2013: Aquarius and SMOS detect effects on an extreme Mississippi River flooding event in the Gulf of Mexico, *Geophys. Res. Lett.*, 40(19), 5188-5193, doi:10.1002/grl.50995.
- Lee, T., D. E. Waliser, J. F. Li; F. W. Landerer, and **M. M. Gierach**, 2013: Evaluation of CMIP3 and CMIP5 Wind Stress Climatology Using Satellite Measurements and Atmospheric Reanalysis Products. *J. Clim.*, 26(16), 5810-5826, doi:<http://dx.doi.org/10.1175/JCLI-D-12-00591.1>.
- Lee, T., G. Lagerloef, **M. M. Gierach**, H.-Y. Kao, S. Yueh, and K. Dohan, 2012: Aquarius reveals salinity signature of tropical instability waves. *Geophys. Res. Lett.*, 39, L12610, doi:10.1029/2012GL052232.
- Gierach, M. M.**, T. Lee, D. Turk, and M.J. McPhaden, 2012: Biological response to the 1997-98 and 2009-10 El Niño events in the equatorial Pacific Ocean. *Geophys. Res. Lett.*, 39, L10602, doi:10.1029/2012GL051103.
- Gierach, M. M.**, H. C. Graber, and M. J. Caruso, 2012: SAR-derived gap jet characteristics in the lee of the Philippine Archipelago. *J. Remote Sens. Environ.*, 117, 289-300.
- Gierach, M. M.**, B. Subrahmanyam, and P. G. Thoppil, 2009: Physical and biological responses to Hurricane Katrina (2005) in a 1/25° nested Gulf of Mexico HYCOM. *J. Mar. Syst.*, 78, 168-179.
- Gierach, M. M.**, B. Subrahmanyam, A. Samuels, and K. Ueyoshi, 2009: Hurricane-driven alteration in plankton community size structure in the Gulf of Mexico: A modeling study. *Geophys. Res. Lett.*, 36, L07604, doi:10.1029/2009GL037414.
- Gierach, M. M.**, and B. Subrahmanyam, 2008: Biophysical responses of the upper ocean to major Gulf of Mexico hurricanes in 2005. *J. Geophys. Res. Oceans*, 113, C04029, doi:10.1029/2007JC004419.
- Gierach, M. M.**, and B. Subrahmanyam, 2007: “Global ocean color and phytoplankton”, State of the Climate in 2006. *Bull. Amer. Meteor. Soc.*, 88, S43-S45.
- Gierach, M. M.**, and B. Subrahmanyam, 2007: Satellite data analysis of the upper ocean response to Hurricanes Katrina and Rita (2005) in the Gulf of Mexico. *IEEE Geosci. Remote Sens. Lett.*, 4, 132-136.

Gierach, M. M., M. A. Bourassa, P. Cunningham, J. J. O'Brien, and P. D. Reasor, 2007: Vorticity-based detection of tropical cyclogenesis. *J. Appl. Meteor. Climatol.*, 46, 1214-1229.

CONFERENCE PRESENTATIONS

- Gierach, M. M., et al., 2014: EN...SO? The significance of El Niño and its impacts, *United Nations Climate Change Conference (COP-20)*, December, Lima, Peru.
- Gierach, M. M., et al., 2014: Application of hyperspectral airborne PRISM imagery to evaluate coastal and inland environments in California, *Ocean Optics XXII*, October, Portland, ME.
- Gierach, M. M., M. Messié, T. Lee, K.B. Karnauskas, and M.-H. Radenac, 2014: Biophysical Responses near Equatorial Islands in the Western Equatorial Pacific Ocean during El Niño/La Niña Transitions, *2014 Ocean Sciences Meeting*, February, Honolulu, HI.
- Gierach, M. M., J. Vazquez, T. Lee, V. Tsontos, 2014: Aquarius and SMOS detect effects on an extreme Mississippi River flooding event in the Gulf of Mexico, *2014 Ocean Sciences Meeting*, February, Honolulu, HI.
- Gierach, M. M., T. Lee, D. Turk, and M. J. McPhaden, 2013: Biophysical response to the 1997-98 And 2009-10 El Niño events in the equatorial Pacific Ocean, *U.S. CLIVAR ENSO Diversity Workshop*, February, Boulder, CO.
- Gierach, M. M., T. Lee, D. Turk, and M. J. McPhaden, 2012: Wind-induced biophysical responses to central and eastern Pacific El Niño, *2012 Fall Meeting*, American Geophysical Union, December, San Francisco, CA.
- Gierach, M. M., T. Lee, D. Turk, and M. J. McPhaden, 2012: Biophysical response to the 1997-98 And 2009-10 El Niño events in the equatorial Pacific Ocean. *2012 Ocean Sciences Meeting*, American Geophysical Union, February, Salt Lake City, UT.
- Gierach, M. M., and T. Lee, 2011: Consistency of sea surface temperature analyses in depicting ENSO behavior. *Pattullo Conference*, Mentoring Physical Oceanography Women to Increase Retention (MPOWIR), October, Warrenton, VA.
- Gierach, M. M., and T. Lee, 2011: Consistency of sea surface temperature analyses in depicting ENSO behavior. *WCRP Open Science Conference*, WCRP. October, Denver, CO.
- Gierach, M. M., H. C. Graber, and M. J. Caruso, 2010: SAR-derived gap jet characteristics in the lee of the Philippine Archipelago. *2010 Fall Meeting*, American Geophysical Union, December, San Francisco, CA.
- Gierach, M. M., and H. C. Graber, 2010: SAR-derived gap flow characteristics in the lee of the Philippine Island Archipelago. *Pattullo Conference*, Mentoring Physical Oceanography Women to Increase Retention (MPOWIR), October, Charleston, SC.
- Gierach, M. M., and H. C. Graber, 2010: SAR-derived gap flow characteristics in the lee of the Philippine Island Archipelago. *2010 Ocean Sciences Meeting*, American Geophysical Union, February, Portland, OR.
- Gierach, M. M., and B. Subrahmanyam, 2008: Hurricane contribution to pCO₂ distribution in the Gulf of Mexico. *2008 Fall Meeting*, American Geophysical Union, December, San Francisco, CA.
- Gierach, M. M., and B. Subrahmanyam, 2008: Hurricane-induced responses in the Gulf of Mexico as observed through a 1/25° nested Gulf of Mexico HYCOM. *SC08: International Conference for High Performance Computing, Networking, Storage, and Analysis*, November, Austin, TX.
- Gierach, M. M., 2008: Upper ocean response to Hurricane Katrina (2005) in the Gulf of Mexico using multi-sensor satellite observations and model simulations. *5th Physical Oceanography Dissertation Symposium (PODS V)*, October, Honolulu, HI.
- Gierach, M. M., and B. Subrahmanyam, 2008: Multi-sensor satellite and HYCOM analysis of the upper ocean response to Hurricane Katrina in the Gulf of Mexico. *28th Conference on*

- Hurricanes and Tropical Meteorology*, American Meteorological Society, April, Orlando, FL.
- Gierach, M. M., B. Subrahmanyam, and P. Thoppil, 2008: Upper ocean response to Hurricane Katrina (2005) in a 1/25° nested Gulf of Mexico HYCOM. *2008 Ocean Sciences Meeting*, American Geophysical Union, March, Orlando, FL.
- Gierach, M. M., and B. Subrahmanyam, 2006: Upper ocean response to Hurricanes Katrina and Rita (2005) from multi-sensor satellites. *2006 Fall Meeting*, American Geophysical Union, December, San Francisco, CA.
- Hite, M. M., M. A. Bourassa, P. Cunningham, J. J. O'Brien, and P. D. Reasor, 2006: Vorticity-based detection of tropical cyclogenesis. *27th Conference on Hurricanes and Tropical Meteorology*, American Meteorological Society, April, Monterey, CA.
- Hite, M. M., M. A. Bourassa, and J. J. O'Brien, 2006: Vorticity-based detection of tropical cyclogenesis. *14th Conference on Interaction of the Sea and Atmosphere*, American Meteorological Society, February, Atlanta, GA.

PRESENTATIONS AT PROFESSIONAL MEETINGS

- Gierach, et al., 2015: The Portable Remote Imaging SpectroMeter (PRISM). HyspIRI Symposium and Aquatic Forum, Greenbelt, MD, June 3-5.
- Gierach, M. M., J. Vazquez, T. Lee, V. Tsontos, 2013: Aquarius and SMOS detect effects on an extreme Mississippi River flooding event in the Gulf of Mexico. Aquarius/SAC-D Science Team Meeting, Buenos Aires, Argentina, Nov. 12-14.
- Gierach, M. M., T. Lee, D. Turk, and M. J. McPhaden, 2013: Biological response to the 1997-98 and 2009-10 El Niño events in the equatorial Pacific Ocean. International Ocean Color Science (IOCS) Meeting, Darmstadt, Germany, May 6-8.
- Gierach, M. M., T. Lee, D. Turk, and M. J. McPhaden, 2012: El Niño Personality Affects Ocean Biology. ECCO Meeting, Pasadena, CA, November 1.
- Gierach, M. M., T. Lee, D. Turk, and M. J. McPhaden, 2012: Biophysical response to the 1997-98 And 2009-10 El Niño events in the equatorial Pacific Ocean. Ocean Color Research Team Meeting, Seattle, WA, April 23 - 25.
- Gierach, M. M., and T. Lee, 2011: Consistency of sea surface temperature analyses in depicting ENSO behavior. GHRSST Science Team Meeting, Edinburgh, UK, June 27 – July 1.
- Gierach, M. M., W. M. Drennan, E. Sahlée, and A. Bentamy, 2011: Comparison of buoy measurements and satellite observations during SoGasex. NASA International Ocean Vector Wind Science Team Meeting, Annapolis, MD, May 9 – 11.
- Gierach, M. M., and B. Subrahmanyam, 2008: Gulf of Mexico response to Hurricane Katrina (2005). NASA Carbon Cycle & Ecosystems Joint Science Workshop, April 28 – May 2.
- Gierach, M. M., and B. Subrahmanyam, 2007: Biophysical feedback mechanisms during Gulf of Mexico hurricanes using satellite observations and HYCOM simulations. NASA Ocean Color Science Team, Seattle, WA, April 11 – 13.

INVITED PRESENTATIONS

- Gierach, M. M., 2013: Contrasting biophysical responses to central and eastern Pacific El Niño, Environmental Science and Engineering Seminar Series, California Institute of Technology, Pasadena, CA, January 16.
- Gierach, M. M., 2012: What hit me? Hurricanes and climate change, NASA/JPL Climate Day, Pasadena Convention Center, Pasadena, CA, November 16.

- Gierach, M. M., 2012: Contrasting biophysical responses to central and eastern Pacific El Niño, MPOWIR NASA Speaker Series, NASA Goddard Space Flight Center, Greenbelt, MD, August 22.
- Gierach, M. M., 2012: The satellite era: What ocean observations tell us about climate change. Museum of Flight Climate Day, Jet Propulsion Laboratory (virtual studio), CA, April 5.
- Gierach, M. M., 2012: The El Niño you don't know and why it matters to you. COSEE-West Workshop, Jet Propulsion Laboratory, CA, February 18.
- Gierach, M. M., 2012: What hit me? The biological affects on marine life of hurricanes and extreme storm events. COSEE-West Lecture, Jet Propulsion Laboratory, CA, February 15.
- Gierach, M. M., 2010: SAR-derived gap jet characteristics in the lee of the Philippine Archipelago. Jet Propulsion Laboratory, Pasadena, CA, November 15.
- Gierach, M. M., 2009: Analysis of the upper ocean response to hurricanes in the Gulf of Mexico using satellite observations and model simulations. NOAA National Oceanographic Data Center, Silver Spring, MD, April 23.
- Gierach, M. M., 2009: Analysis of the upper ocean response to hurricanes in the Gulf of Mexico using satellite observations and model simulations. NASA Goddard Space Flight Center, Global Modeling and Assimilation Office, Greenbelt, MD, April 22.
- Gierach, M. M., 2009: Analysis of the upper ocean response to hurricanes in the Gulf of Mexico using satellite observations and model simulations. University of Miami, Rosenstiel School of Marine and Atmospheric Science, Applied Marine Physics Division, Miami, FL, April 15.
- Gierach, M. M., 2009: Upper ocean response to Hurricane Katrina (2005) in the Gulf of Mexico using multi-sensor satellite observations and model simulations. Department of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL, January 28.
- Gierach, M. M., 2008: A look at hurricanes through the “eyes” of various satellite sensors. COSEE Taking the Pulse of Our Coastal Ocean Workshop, Jacksonville University, Jacksonville, FL, July 10.
- Gierach, M. M., 2008: Hurricanes: Misunderstood giants. 2008 Ocean Science Bowl, Columbia, SC, February 23.
- Gierach, M. M., 2006: Satellite observations and model simulations of the upper ocean response to hurricanes in the Gulf of Mexico. Jet Propulsion Laboratory, Pasadena, CA, December 7.